AUTHOR: Lazarev, V. B. SOV/78-3-10-20/35

TITLE: On the Surface Tension of Ternary Systems (O poverkhnostnom natyazhenii troynykh sistem)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1958, Vol 3, Nr 10, pp 2347-2353 (USSR)

ABSTRACT: The term of the limit surface activity was introduced for the ternary systems. The surface tension of the ternary systems in dependence on the concentration of the independent components was presented by the equations 11 and 11a.

$$\left(\frac{\partial\sigma}{\partial c_{N_1}}\right)_{c_{N_2}} = -\frac{RTN}{\omega}\left[\frac{(e^{\Delta_2}-1)c_{N_2}\frac{\partial f_2}{\partial c_{N_1}} + (e^{\Delta_1}-1)+c_{N_1}(e^{\Delta_1}-1).\frac{\partial f_1}{\partial c_{N_1}}}{1+(e^{\Delta_1}-1)c_{N_1}+(e^{\Delta_2}-1)c_{N_2}}\right] \quad (11)$$

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$$\left(\frac{\partial\sigma}{\partial c_{N_2}}\right)_{c_{N_1}} = -\frac{RTN}{\omega}\left[\frac{(e^{\Delta_1}-1)c_{N_1}\frac{\partial f_1}{\partial c_{N_2}} + (e^{\Delta_2}-1)+c_{N_2}(e^{\Delta_2}-1)\frac{\partial f_2}{\partial c_{N_2}}}{1+(e^{\Delta_1}-1)c_{N_1}+(e^{\Delta_2}-1)c_{N_2}}\right] \quad (11a)$$

The following equations (12) and (12a) were given for the ternary systems, taking into account the limit values of surface activity G_{o1} and G_{o2}:

$$G_{o1} = \lim_{c_{N_1}\to o}\left(-\frac{\partial\sigma}{\partial c_{N_1}}\right)_{c_{N_2}} = \frac{RTN}{\omega}\left[\frac{(e^{\Delta_2}-1)c_{N_2}\cdot\frac{\partial f_2}{\partial c_{N_1}} - (e^{\Delta_1}-1)}{1+(e^{\Delta_2}-1)c_{N_2}}\right] \quad (12)$$

$$G_{o2} = \lim_{c_{N_2}\to o}\left(-\frac{\partial\sigma}{\partial c_{N_2}}\right)_{c_{N_1}} = \frac{RTN}{\omega}\left[\frac{(e^{\Delta_1}-1)c_{N_1}\cdot\frac{\partial f_1}{\partial c_{N_2}} + (e^{\Delta_2}-1)}{1+(e^{\Delta_1}-1)c_{N_1}}\right] \quad (12a)$$

Card 2/4

On the Surface Tension of Ternary Systems

The limit values of the surface activity of cadmium, potassium and cesium in solutions of mercury-cadmium-potassium and mercury-cadmium-cesium were calculated by the graphic method. From the equation 12 follows that the limit values of surface tension of potassium and cesium are increased with the increase in concentration of the cadmium. On the basis of the results obtained for the surface tension of mercury-cadmium-potassium solutions and mercury-cadmium-cesium solutions at 22°C the adsorption of alkali metals in ternary solutions was calculated for three constant concentrations of cadmium and potassium. It was demonstrated that the adsorption of cadmium metals passes through maximum values. The dependence of the adsorption of urethan in the system sodium chloride-urethan-water on the concentration of urethan was investigated at three different concentrations of sodium chloride. All the rules governing the adsorption, which were determined by the investigations of mercury-cadmium-potassium and mercury-cadmium-cesium solutions, correspond completely to the molecular theory of the limit phenomena of surface tension in solutions. There are 8 figures and 9 references, 4 of which are Soviet.

86765

S/076/60/034/011/020/024
B004/B064

11.8950

AUTHORS: Pugachevich, P. P. and Lazarev, V. B. (Moscow)

TITLE: A Device for Measuring the Surface Tension of Melts at High Temperatures

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 11, pp. 2607-2609

TEXT: The apparatus shown in Fig. 1 is used to determine the surface tension of melts at temperatures of up to 1600-1800°C by measuring the maximum gas bubble pressure. The cylindrical cover 1 is sealed with the rubber ring 3 and screwed into the plate 5 with the screw bolt 4; the plate is firmly fixed to the base 6. The stand 7, the upper part of which is made of refractory material, the lower one of heat-resistant steel, is connected with 5 through the brass bellow 9, and is lifted by the appliance 5. It is fixed with the screws 13,14. The height of 7 is read by means of the rod 8 and the nonius 11 which are on plate 12. The crucible 15 with the substance to be examined 16 stands on the stand. The substance is molten in a vacuum by means of a cylindrical heater 17 made of a 0.1 mm

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86785

S/076/60/034/011/020/024
B004/B064

A Device for Measuring the Surface Tension of Melts at High Temperatures

thick tantalum plate which is fed by the power current of an OCY-20 (OSU-20) step-down transformer. The current is supplied through the water-cooled feeding pipes 18 and 19 which are insulated against 5. The molybdenum screens 20 on the base 21 are used to prevent thermal radiation. Temperature is measured either with a thermocouple or with a pyrometer through the sight hole 27. Two capillaries 25 and 26 of different diameters are dipped into the melt. By means of lithium heated to 300°C and solid CO_2, argon purified with alcohol is passed through the capillaries, and the maximum pressure is determined with a magnetic diaphragm gauge. The surface tension is determined from an equation given by S. Sugden (Ref. 2). There are 2 figures and 2 non-Soviet references.

ASSOCIATION: Akademiya nauk, Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova (Academy of Sciences of the USSR, Institute of General and Inorganic Chemistry imeni N. S. Kurnakov)

SUBMITTED: June 27, 1960

Card 2/3

Ca

83564

9.4340

S/020/60/134/001/016/021
B004/B060

AUTHORS: Lazarev, V. B., Pugachevich, P. P.

TITLE: The Temperature Dependence of the Surface Stress of Germanium

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 134, No. 1, pp. 132 - 133

TEXT: By way of introduction, the authors discuss the data published on the surface stress of germanium and the errors involved in the methods applied. They determined the surface stress by measuring the maximum pressure in a gas bubble according to the theory developed by M. Cantor (Ref. 8). The capillaries required for the purpose were prepared from spectroscopically pure graphite. Germanium single crystals of a resistivity of 20 ohm.cm were heated in a vacuum furnace through which argon was fed. The values for the density of the molten Ge required for the calculation of the surface stress, σ, were taken from Ref. 13, and extrapolated up to 1400°C. The maximum error for σ was 1%. It was found that $\sigma = 621.4 - 0.261(t^\circ - 936^\circ)$, where t° is the temperature in

Card 1/2

The Temperature Dependence of the Surface Stress of Germanium

S/020/60/134/001/016/021
B004/B060

degrees centigrade, and 936°C is the melting point of Ge according to Ref. 14. The value of 621.4 dynes/cm holding for this temperature is in good agreement with the value calculated by S. N. Zadumkin (617 dynes/cm). As opposed thereto, the temperature coefficient $d\sigma/dT = -0.21$, determined by the authors experimentally, deviates markedly from Zadumkin's value (-0.054). This may be due to the structural change of the melt, which was not considered by Zadumkin. The experimental data are given in Table 1 and graphically reproduced in Fig. 1. There are 1 figure, 1 table, and 15 references: 9 Soviet, 4 US, 1 British, 1 German, and 1 French.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova Akademii nauk SSSR (Institute of General and Inorganic Chemistry imeni N. S. Kurnakov of the Academy of Sciences USSR)

PRESENTED: April 13, 1960, by I. I. Chernyayev, Academician

SUBMITTED: April 11, 1960

LAZAREV, V.B.; PUGACHEVICH, P.P.

Limiting surface activity of ternary solutions. Zhur. fiz. khim. 35 no.2:314-318 F '61. (MIRA 16:7)

1. Institut obshchey i neorganicheskoy khimii imeni Kurnakova AN SSSR.
(Systems (Chemistry)) (Surface chemistry)

PUGACHEVICH, P.P.; LAZAREV, V.B.

Empirical study of the surface tension of metallic solutions. Part 3: Surface phenomena in the ternary matallic solutions Hg - Cd - K and Hg - Cd - Cs at 22°. Zhur. fiz. khim. 35 no.3:530-534 Mr '61. (MIRA 14:3)

1. Akademiya nauk SSSR, Institut obshchey i neorganicheskoy khimii im. N.S. Kurnakova.

(Surface tension) (Amalgams)

TIMOFEYEVICHEVA, O.A.; LAZAREV, V.B.

Temperature dependence of the surface tension of thallium. Dokl.AN SSSR 138 no.2:412-414 My '61. (MIRA 14:5)

1. Institut obshchey i neorganicheskoy khimii im. N.S.Kurnakova Akademii nauk SSSR. Predstavleno akademikom I.V.Tananayevym.
(Surface tension) (Thallium)

33985

S/062/62/000/002/010/013
B117/B138

11.4110

AUTHORS: Timofeyevicheva, O. A., and Lazarev, V. B.

TITLE: Surface tension of metallic cesium

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 2, 1962, 358 - 359

TEXT: The surface tension of cesium was repeatedly measured at three different temperatures with a glass instrument devised by O. A. Timofeyevicheva and based on the bubble pressure principle. The following values were found: σ = 67.5 dynes/cm at 62°C; σ = 62.9 dynes/cm at 146°C; σ = 62.4 dynes/cm at 152°C. These results are in good agreement with the theoretical data available in the literature. There are 1 figure and 12 references: 5 Soviet and 7 non-Soviet. The two references to English-language publications read as follows: E. E. Poindexter, M. Kernachan, Phys. Rev. 27, 820 (1926); J. W. Taylor, Philos. Mag. 46, 867 (1955).

Card 1/2

33985
S/062/62/000/002/010/013
B117/B138

Surface tension of metallic cesium

ASSOCIATION: Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova Akademii nauk SSSR (Institute of General and Inorganic Chemistry imeni N. S. Kurnakov of the Academy of Sciences USSR)

SUBMITTED: February 7, 1961 (initially),
October 26, 1961 (after revision)

Card 2/2

SEMENCHENKO, V.K.; LAZAREV, V.B.

Dependence of the surface tension of ternary solutions on component concentration and temperature. Izv. AN SSSR. Otd.khim.nauk no.11: 2089-2091 N '62. (MIRA 15:12)

1. Institut obshchey i neorganicheskoy khimii im. N.S. Kurnakova AN SSSR.

(Systems (Chemistry)) (Surface tension)

33617

1.1800

S/032/62/028/002/020/037
B139/B104

AUTHORS: Pugachevich, P. P., and Lazarev, V. B.

TITLE: Tinning of high-melting metals and graphite

PERIODICAL: Zavodskaya laboratoriya, v. 28, no. 2, 1962, 208

TEXT: Oxide films and impurities are removed from band and rod profiles and other parts of tungsten, tantalum, molybdenum, and graphite which are then for some minutes kept in a vacuum furnace at $\sim 10^{-4}$ mm Hg and 1100 - 1200°C, and dipped into molten tin in the same furnace at 1100 - 1200°C. Thus, uniform tinning is guaranteed, and the parts treated can be soldered to copper parts by usual methods. Good adhesion of larger surfaces is reached by joining parts before they are dipped into molten tin under the conditions mentioned. Thus, graphite can be tinned and soldered to parts of high-melting metals by the vacuum dipping method. In tensile strength tests of such joints, cracks occur in the graphite mass. It was also possible to provide graphite with a smooth cadmium coating by vacuum dipping at 450°C. [Abstracter's note: Essentially complete translation.]

Card 1/2

33417
S/032/62/028/002/020/037
B139/B104

Tinning of high-melting metals...

ASSOCIATION: Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova Akademii nauk SSSR (Institute of General and Inorganic Chemistry im. N. S. Kurnakov of the Academy of Sciences SSSR)

X

Card 2/2

35595
S/020/62/143/003/023/029
B101/B144

11.4110

AUTHORS: Timofeyevicheva, O. A., Lazarev, V. B., and Pershikov, A. V.

TITLE: Dependence of surface tension of cesium on temperature

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 143, no. 3, 1962, 618 - 620

TEXT: The surface tension of Cs at 62 - 280°C was measured. As Cs wets the glass well in vacuum and in inert atmosphere the method of maximum pressure in the gas bubble was chosen, and a special apparatus constructed (Fig. 1). After evacuation of the apparatus ~40 g Cs were distilled in vacuum through the tube 3 into the containers 1 and 2, the apparatus was filled with purified argon up to a pressure of 480 mm Hg, melted at 4,4', and placed in a thermostat. Turning clockwise in the plane of the figure filled the manometer 5 and the lower part of 6 with Cs, so that the capillary 7 dipped into Cs. After returning to the original position the metal residue in 2 was led through 8 and 9 into 1 by turning the apparatus round the x-x_1 axis. The plane of 5 forms a small angle with the symbol plane, so that Cs could not flow out of 5 and 6. The resulting difference in pressure led to the formation of gas bubbles in capillary 7.

B

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Card 1/2

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...kurnakov of the Academy of

S/020/62/146/001/015/016
B101/B144

AUTHORS: Lazarev, V. B., Pershikov, A. V.

TITLE: Experimental determination of the surface tension of molten neodymium

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 146, no. 1, 1962, 143 - 144

TEXT: The surface tension, σ, of neodymium freed from neodymium oxide traces by filtering through beryllium oxide and tantalum funnels in $1 \cdot 10^{-5}$ mm Hg vacuum was measured in vacuo by determining the maximum pressure of an argon bubble. The argon was purified by bubbling through molten lithium at 300°C. Polymethyl-phenyl siloxane vacuum oil was used as manometer liquid. Results: (1) σ is a linear function of temperature, amounting (in dynes/cm) to 688 at 1030°C and 674 at 1186°C. These values are in good agreement with the theoretical value of 600 dynes/cm obtained by S. N. Zadumkin, B. S. Tambiyev (Uch. zap. Kabardino-Balkarsk. gos. univ., 13, 47 (1961)). (2) The curves for surface tension, density, and reciprocal isothermal compressibility versus atomic number show a similar course for the lanthanides. Thus a close relationship exists between

Card 1/2

Experimental determination of... S/020/62/146/001/015/016
B101/B144

surface and bulk properties of substances. There are 3 figures and 1 table.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova Akademii nauk SSSR (Institute of General and Inorganic Chemistry imeni N. S. Kurnakov of the Academy of Sciences USSR)

PRESENTED: April 2, 1962, by I. V. Tananayev, Academician

SUBMITTED: March 28, 1962

Card 2/2

1015

S/020/62/146/004/010/015
B101/B186

AUTHORS: Lazarev, V. B., Dashevskiy, M. Ya.

TITLE: Surface tension of indium - antimony melts

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 146, no. 4, 1962, 822 - 825

TEXT: The surface tension of 26 In - Sb melts of various concentrations was measured range of 550 - 700°C for the following purposes: (1) to find out whether a singular point in the diagram of surface tension versus composition corresponds to the singular point in the phase diagram of a given system in which congruently melting InSb is formed, and (2) to obtain data on the surface tension of melts with a non-stoichiometric composition, -such data being of practical importance in pulling InSb single crystals. The authors prepared the specimens according to Czochralski's method. The surface tension σ was determined from the maximum pressure of a gas bubble. The wall of the quartz capillary was ground to a thickness of 0.01 mm to facilitate calculation of σ. The measurement was conducted in an atmosphere of argon at approximately 100 mm Hg with a maximum total error of 1.2 %, corresponding to ~7.0 dyne/cm. Results: σ_{In} is in good agreement

Card 1/3

Surface tension of indium - ...

S/020/62/146/004/010/015
B101/B186

PRESENTED: May 20, 1962, by I. I. Chernyayev, Academician

SUBMITTED: May 20, 1962

Card 3/3

ACCESSION NR: AT4030798 S/0000/63/000/000/0125/0132

AUTHOR: Lazarev, V. B.; Dashevskiy, M. Ya.

TITLE: A study of surface phenomena in melts of the In-Sb system

SOURCE: AN UkrSSR. Institut metallokeramiki i spetsial'ny*kh splavov. Poverkhnostny*ye yavleniya v rasplavakh i protsessakh poroshkovoy metallurgii (surface phenomena in liquid metals and processes in powder metallurgy). Kiev, Izd-vo AN UkrSSR, 1963, 125-132

TOPIC TAGS: surface phenomenon, indium, antimony, indium based alloy, antimony containing alloy, surface tension, indium antimonide

ABSTRACT: In this paper the authors presented the results of an investigation of the concentration and temperature relationships of the surface tension of indium-antimony system melts with the congruently melted chemical compound indium antimonide. It was explained that a correspondence exists between the spatial points on the structural diagram of the indium-antimony system and on the diagram surface tension-composition. In addition, experimental data was obtained on the surface tension of melts for which the composition does not strongly differ from the stoichiometric melt of the indium-antimonide compound. A diagram of the instrument

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ACCESSION NR: AT4030798

for determining the surface tension was presented. Results were presented in graphs. The temperature relationship of the surface tension was studied as the following: indium (at a temperature range of 200-800°C), antimony (at a temperature range of 650-800°C) and 26 alloys of the indium-antimony system at a temperature range of 550-700°C. It was established that throughout the entire investigated temperature range, antimony is surface active in relation to indium. It was shown that the existence of an intermetallic compound in the indium-antimony system finds representation in the isotherms of the surface tension in the melts of this system. Orig. art. has: 6 figures and 2 formulas.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii AN SSSR, Moscow (Institute of General and Inorganic Chemistry, AN SSSR)

SUBMITTED: 23Nov63 DATE ACQ: 16Apr64 ENCL: 00

SUB CODE: ML NO REF SOV: 012 OTHER: 008

Card 2/2

S/062/63/000/003/015/018
B101/B186

AUTHOR: Lazarev, V. B.

TITLE: Problem of the regularities of the adsorption on metal melts

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 3, 1963, 565 - 567

TEXT: In a previous study (Dokl. AN SSSR, 146, 872 (1962)) it was found that the isotherms of the surface tension of In-Sb melts show an inflection in the concentration range, which corresponds to the formation of InSb. Now the adsorption was calculated according to the equation $\Gamma_1^N = -(1 - N_1)\partial\sigma/RT\partial \ln a_1$. Γ is the adsorption, N_1 the molar part of the component 1, σ the surface tension, a_1 the activity of the component 1. It was found that Γ passes through two maxima if the Sb content is changed from 0 - 100 at %. One of these lies at 6 at % Sb, the second at 52 at % Sb and there also is a minimum at 50 at % Sb, which is where the stoichiometric composition corresponds to InSb. The maximum at 52 at % Sb and the minimum at 50 at % Sb become gradually flatter with increasing temperature

Card 1/2

Problem of the regularities of ...

and at 700°C they already come within the range of experimental error. From the function $\Gamma = f(a,T)$ the adsorption heat was calculated to be 3.450 kcal/mole at 450°C, i. e. very near to the heat of formation of the InSb. There are 2 figures.

ASSOCIATION: Institut obshchey i neorganicheskoy khimiiiim. N. S. Kurnakova Akademii nauk SSSR (Institute of General and Inorganic Chemistry imeni N. S. Kurnakov of the Academy of Sciences USSR)

SUBMITTED: October 23, 1962

L 16929-63 EWP(q)/EWT(m)/BDS AFFTC JD

S/076/63/037/004/021/029

AUTHOR: Lazarev, V. B., Pershikov, A. V. 56

TITLE: Surface tension of strontium

PERIODICAL: Zhurnal fizicheskoy khimii, V. 37, No. 4, 1963, 907-908

TEXT: The surface tension of melted strontium in the range from 775-883 degrees is measured. The method of maximum pressure in a gas bubble with the employment of two capillaries of different diameters which are set accurately in the same horizontal plane is used. The experimental data which is obtained agrees well with the conclusions of the statistical electron theory of surface tension which was developed by S. N. Zadumkin. There is 1 figure. The most important English-language reference reads as follows: J. Taylor, Metallurgia, 50 (300), 161, 1954.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii imeni N. S. Kurnakova, Akademiya nauk SSSR (Institute of General and Inorganic Chemistry imeni N. S. Kurnakov, Academy of Sciences USSR)

SUBMITTED: June 9, 1962

Card 1/1

LAZAREV, V.B.; PERSHIKOV, A.V.

Surface tension of strontium. Zhur. fiz. khim. 37 no.4:907-908 Ap '63. (MIRA 17:7)

1. Institut obshchey i neorganicheskoy khimii imeni N.S. Kurnakova AN SSSR.

YASHKICHEV, V.I.; LAZAREV, V.B.

Measurement of the surface tension of electrolytic copper by the method of maximum gas bubble pressure. Izv.AN SSSR. Ser.khim. no.1:170-172 Ja '64. (MIRA 17:4)

1. Institut obshchey i neorganicheskoy khimii im. N.S.Kurnakova AN SSSR.

L 10631-65 EWT(m)/T/EWP(b) IJP(c)/SSD/AFWL/RAEM(t) JD
ACCESSION NR: AP4041170 S/0062/64/000/006/1104/1106

AUTHOR: Lazarev, V. B.; Abdusalyamova, M. N.

TITLE: Relationship between the surface tension of thallium sulfide and temperature. B

SOURCE: AN SSSR. Izv. Seriya khimicheskaya, no. 6, 1964, 1104-1106

TOPIC TAGS: thallium sulfide, surface tension, sulfur, surface active effect

ABSTRACT: The surface tension-temperature relationship of Tl_2S in the 500-700C temperature range was found to be linear: $\sigma = 215.6 - 0.0356\,(t-t_m)$ where t is in degrees C and T_m = 445C. Values for the surface tension were obtained from calculation by the Sugden formula

$$\sigma = \frac{1}{2}\,\frac{P_1 - P_2}{1/r_1 - 1/r_2} \qquad (1)$$

and the Cantor-Schrodinger formula

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L 10631-65

ACCESSION NR: AP4041170

$$\sigma = \frac{1/2 (P_1 - P_2) - 1/2\rho (r_1 - r_2) g - 1/16\rho^2 g^2 \left(\frac{r_1^2}{P_1} - \frac{r_2^2}{P_2}\right)}{1/r_1 - 1/r_2} \quad (2)$$

where x_1 and x_2 are the effective values of the radius of the capillaries (r_1, r_2) and ρ is the density of the liquid these values differ by less than 1%. Sulfur was found to have a marked surface-active effect on the surface tension of thallium. It is noted that in the elements in the subgroup S, Te and Se the surface tension of the materials decreases with decreasing atomic number, which differs from elements in the I-IV groups, where the surface tension decreases with increasing atomic numbers. Orig. art. has: 3 equations and 1 table.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova Akademii nauk SSSR (Institute of General and Inorganic Chemistry, Academy of Sciences SSSR)

SUBMITTED: 22Nov63 ENCL: 00

SUB CODE: IC, ME NO REF SOV: 006 OTHER: 004

Card 2/2

ACCESSION NR: AP4019515 S/0076/64/038/002/0325/0330

AUTHOR: Lazarev, V. B. (Moscow)

TITLE: Experimental study of surface tension of indium-antimony system melts

SOURCE: Zhurnal fizicheskoy khimii, v. 38, no. 2, 1964, 325-330

TOPIC TAGS: indium surface tension, antimony surface tension, indium antimonide, indium, antimony, In Sb system, binary metal solution

ABSTRACT: The work was prompted by the scarcity of data concerning surface tension of binary metal solutions especially with regard to a relationship between the shape of their surface tension isotherm and the shape of their state diagram. To investigate this problem, the temperature dependence of surface tension of indium antimony alloys has been determined for the entire range of concentrations from pure indium to pure antimony. The melts were prepared in an atmosphere of purified argon (pressure 100 mmHg) and the Sugden method used with two quartz capillaries of uneven diameter and maximum pressure in the gas bubble. The temperature dependence of the

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ACCESSION NR: AP4019515

surface tension had been studied - for indium in the 200-800C range - for antimony in the 650-800C range, and for their alloys-in the 550-700C range. In all these intervals, antimony is surface-active in relation to indium. An inflextion in the isotherm of surface tension shows the existence of their intermetallic compound. The values of antimony adsorption in indium-antimony melts has been calculated. In the 550C adsorption isotherm there are two peaks while the minimum corresponds to the intermetallic compound concentration. The heat of antimony adsorption in these melts has been calculated and its value is commensurable with the heat of indium antimonide formation. Orig. art. has: 5 figures, 3 formulas, 4 tables.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova AN SSSR (Institute of General and Inorganic Chemistry, AN SSSR)

SUBMITTED: 16Nov62 DATE ACQ: 31Mar64 ENCL: 00

SUB CODE: GC NR REF SOV: 019 OTHER: 011

Card 2/2

L 14457-65 EPA(s)-2/EWT(m)/EPF(n)-2/EWP(t)/EWP(b) Pt-10/Pu-4 ASD(a)-5/SSD/AFWL/ASD(m)-3/AS(mp)-2/ESD(gs) WW/JD/JG

ACCESSION NR: AP4046083 S/0076/64/038/009/2265/2267

AUTHOR: Lazarev, V.B.

TITLE: The temperature dependence of surface tension and the critical temperatures of certain metals

SOURCE: Zhurnal fizicheskoy khimii, v. 38, no. 9, 1964, 2265-2267

TOPIC TAGS: surface tension, surface tension temperature function, liquified metal, critical temperature, mercury, cesium, sodium, bismuth, lead, thallium, indium, tin, surface tension thermal coefficient

ABSTRACT: Based on graphical representations of the temperature-liquid and saturated vapor density relationships of metals, especially from works by J. Bender (Phys. Zeitschr., 16, 246, 1915; 19, 410, 1918) and A.V. Grosse (J. Inorg. and Nucl, Chem, 22, No. 12, 23, 1961), it was proposed that the thermal coefficient of the surface tension of metals decreases (i.e., the absolute value of $\frac{\partial \sigma}{\partial T}$ increases) with increasing temperature. As the temperature approaches the critical point, the liquid density- and the saturated vapor

Card 1/2

L 14457-65
ACCESSION NR: AP4046083

density-temperature relationship is no longer linear; the sharp decrease in the degree of difference between the phases results in the increase in $\frac{\sigma}{\rho}$. The σ-temperature function is linear at temperatures near the fusion temperature of the metals: $\sigma = 484.07 - 0.212t - 0.0000946t^2$ (t = degrees C). By extrapolating the σ-temperature curves to $\sigma = 0$, critical temperatures of the following metals were qualitatively evaluated (degrees K): mercury 1678, cesium, 1773, sodium 2280, bismuth 5550, lead 4350, thallium 6400, indium 7000, tin 7400. These values may be high and should be considered as the upper limit of possible critical temperature values. Orig. art. has: 1 table and 2 figures

ASSOCIATION: Akademiya nauk SSSR Institut obshchey i neorganicheskoy khimii im. N.S. Kurnakova (Academy of Sciences SSSR Institute of General and Inorganic Chemistry)

SUBMITTED: 20Jun63 ENCL: 00

SUB CODE: MM, TD NR REF SOV: 013 OTHER: 004

Card 2/2

ACCESSION NR: AP4040958 S/0020/64/156/005/1159/1162

AUTHOR: Lazarev, V. B.

TITLE: Analysis of adsorption layers on molten germanium surface

SOURCE: AN SSSR. Doklady*, v. 156, no. 5, 1964, 1159-1162

TOPIC TAGS: germanium, molten germanium, germanium adsorption layer, semiconductor, solid state physics, gallium, indium, thallium, bismuth, antimony, germanium surface tension, crystallography

ABSTRACT: The authors studied the effects of metals from the third and fifth groups of the periodic table upon the surface tension of germanium. These included Ga, Tl, Sb, Bi, and In. Work was carried out because it is of interest to study the adsorption layers which are formed when surface active substances are added to a semiconductor in order to create a specific type of conductivity. The authors point out that a direct analysis of surface active properties on a crystal is an extremely complex process under experimental conditions, and that this problem has not been completely resolved as yet. The surface properties of the above-mentioned metals were studied on the surface of liquid germanium. The surface tension σ of the metal solutions was measured by the technique of maximum pressure in a gas bubble with the use of two sharp-pointed capillaries of

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different diameter which were immersed in the melt at an identical depth. The measurements were carried out in accordance with a procedure outlined by Yu. M. Shashkov and T. P. Kolesnikova (Zh. F. Kh., 37, (1963), 1397). A special instrument was also devised which enables σ to be measured for a number of metals of varying concentration without disturbing the instrument's airtightness. A diagram of this instrument is shown in Figure 1 of the Enclosure. The surface tension measurements of Ge-Ga, Ge-In, Ge-Th and Ge-Bi solutions were carried out over a temperature range of 950-1150C with a concentration of the second component ranging from 0 to 6 at .%. The surface tension of Ge-Sb melts was measured over a temperature range of 950-1100C. All impurities which were tested, with the exception of gallium, lower the germanium surface tension, although the quantitative surface activity of Bi, Th, In and Sb on Ge differs greatly. Bi and Sb have the highest degree of surface activity on Ge, while In and Ga have the lowest. Considering that the surface activity of the metals upon germanium increases according to the series Ga - In - Th - Sb - Bi, the agreement of this sequence with the change in the difference of the atomic volume of these metals and Ge should be noted. Apparently, a good criterion for the surface tension is the magnitude of the differences of the surface tensions of the solvent and impurity. The greater this value, the higher is the surface activity. In computing these differences, the value for the surface tension should not be

taken at the melting point but at that temperature for which the surface activity is determined. Surface tension is a thermoclynamic magnitude characterizing, in a definite degree, the molecular force field of a substance in a condensed state. Hence, the difference of the surface tensions can be examined as a characteristic of the degree of difference of the molecular force fields. Orig. art. has: 4 figures and 1 table.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova Akademii nauk SSSR (Institute of general and inorganic chemistry, Academy of Sciences SSSR)

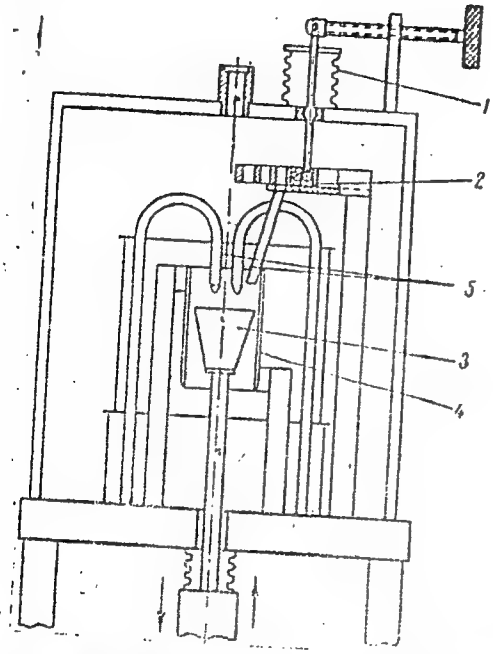
SUBMITTED: 12Feb64

SUB CODE: SS, MM NO REF SOV: 012 ENCL: 01

OTHER: 001

ACCESSION NR: AP4040958

ENCLOSURE: 01



1 - sylphon bellows; 2 - ring; 3 - crucible containing metal to be tested; 4 - heater; 5 - 2 capillary tubes of different diameter

Card 4/4

L 40976-65 EWI(m)/EWA(d)/T/EWP(t)/EWP(z)/EWP(b) Pad LJP(c) JD/HM

ACCESSION NR: AP5006419 S/0062/65/000/001/0170/0172

25
B

AUTHOR: Lazarev, V. B.; Dashevskiy, M. Ya.

TITLE: Surface tension of fusions of germanium-antimony and germanium-nickel

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 1, 1965, 170-172

TOPIC TAGS: germanium, antimony, nickel, germanium alloy, surface tension

ABSTRACT: The surface tension of germanium-antimony and germanium-nickel melts was measured and the adsorption of antimony on the germanium surface was calculated. Relationships were found between the solubility and distribution ratios of the dopants and between the dopant solubility and the surface tensions of solvent and additive. Orig. art. has: 2 tables, 2 figures.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova Akademii nauk SSSR (Institute of General and Inorganic Chemistry, Academy of Sciences SSSR)

SUBMITTED: 26May64 ENCL: 00 SUB CODE: MM, IC

NO REF SOV: 006 OTHER: 001

Card 1/1

L 47[illegible] EPA(s)-2/EWP(e)/EWT(m)/EPF(c)/EWP(i)/[illegible]/EPR/EPA(w)-2/T/EWP(v)/EWP(k)/
EPA(bb)-2/EWP(b)/EWA(c)/EWP(t) Pf-4/Pab-10/Pr-4/Ps-4/Pt-4/Pu-4 IJP(c) JD/WW/
HM/JG/WB

ACCESSION NR: AP5010977 UR/0286/65/000/007/0165/0165

AUTHOR: Lazarev, V. B.; Pershikov, A. V.

TITLE: Tinning of silicon and ceramic articles. Class 49, No. 169986

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 7, 1965, 165

TOPIC TAGS: tinning, silicon tinning, ceramics tinning

ABSTRACT: This Author Certificate introduces a method of tinning silicon and ceramic articles. In order to obtain a vacuum-tight tin layer, the articles to be tinned are placed on a tantalum mandrel, vacuum degassed (10^{-4} mm Hg) at 950—1100C, and then dipped for a short time in a tin bath placed in the same furnace. In a modification of this method, tinning is done in the furnace with a tantalum soldering gun.

[WW]

ASSOCIATION: none

SUBMITTED: 18Feb63 ENCL: 00 SUB CODE: MM, MT

NO REF SOV: 000 OTHER: 000 ATD PRESS: 4005

Card 1/1

L 34500-65 EWT(m)/EPF(c)/EPR/EWP(t)/EWP(b) Pr-4/Ps-4 IJP(c) JD/JG
ACCESSION NR: AP5002797 S/0078/65/010/001/0022/0026

AUTHOR: Lazarev, V. B.; Tsylov, Yu. A.

TITLE: Surface tension of some nitrate solutions of rare earth elements and of aluminum

SOURCE: Zhurnal neorganicheskoy khimii, v. 10, no. 1, 1965, 22-26

TOPIC TAGS: surface tension, Rehbinder apparatus, lanthanum nitrate, neodymium nitrate, aluminum nitrate, tributylphosphate, metaxylene

ABSTRACT: The surface tension (σ) of aqueous solutions of $La(NO_3)_3$ and $Nd(NO_3)_3$ and of these solutions containing $Al(NO_3)_3$, tributyl phosphate (TBP), metaxylene or TBP-metaxylene mixtures was measured using a modified Rehbinder apparatus (Z. Phys. Chem. 111, 447 (1924)). The dependence of σ of aqueous solutions of rare earth element nitrates on their concentration c (from 50-250 g/l) and on temperature t (20-60C) was found:

$$\sigma = 75.02 + 2.775 \cdot 10^{-2} c - 0.148t$$

The La, Nd and Al nitrates are surface-inactive with respect to water; the value

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L 34500-65
ACCESSION NR: AP5002797

of their surface activity, which is negative, increased in absolute value with increase in temperature. The σ-t relationships for TBP, metaxylene and their mixtures were determined: $\sigma_{TBP} = 29.46 - 0.067t$; $\sigma_{m\text{-}xylene} = 30.57 - 0.097t$. At 40C σ was independent of the composition of mixtures of TBP and metaxylene. The σ of TBP and some of the TBP-metaxylene mixtures in equilibrium with $La(NO_3)_3$ was found to be a complex function of all 3 components of the system. Orig. art. has: 6 tables and 1 figure.

ASSOCIATION: Institut obshchey i neorganicheskiy khimii im. N. S. Kurnakova Akademii nauk SSSR (Institute of General and Inorganic Chemistry, Academy of Sciences SSSR)

SUBMITTED: 19May64 ENCL: 00 SUB CODE: GC

NR REF SOV: 012 OTHER: 002

Card 2/2

L 34979-65 EPA(s)-2/EWT(m)/EPF(n)-2/EWA(d)/T/EWP(t)/EWP(b) Pt-10/Pu-4 IJP(c)
JD/WW/JG

ACCESSION NR: AP5004353 S/0076/65/039/001/0072/0078

AUTHOR: Lazarev, V. B.

TITLE: Surface phenomena in molten germanium alloys

SOURCE: Zhurnal Fizicheskoy khimii, v. 39, no. 1, 1965, 72-78

TOPIC TAGS: germanium alloy, surface tension, adsorption, germanium surface

ABSTRACT: Since the adsorption of various substances on the surface of a semiconductor changes its electrical and physical properties, it is of interest to investigate the adsorbed layers formed on the outer boundary of the semiconductor by surface active impurities. The goal of this work was to study the effect of antimony, bismuth, indium, gallium and thallium on the surface tension of germanium since some of these elements are used for doping germanium. The maximum bubble pressure method was used for measurement of the surface tension σ of metallic solutions. The measurements were made in the 950-1150°C range with concentration of the second component varying from 0 to 6 atom %. The surface tension of Ge-Sb melts was measured in the 950-1100°C range. The amounts of Bi, Sb, Tl, In and Ga adsorbed on the germanium surface layer were determined. The surface area of the atoms of these adsorbed metals was calculated. In terms of the

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L 34979-65

ACCESSION NR: AP5004353

impurity concentrations now being realized in the semiconductor industry, the adsorption layers formed by Bi, Sb, Tl and In on the germanium surface were not even close to the saturation point. The experimental data were compared with the surface activity criteria for metals which are available in the literature. It is suggested that the difference in the surface energies of two metals may be used to find the difference in their molecular force fields. Orig. art. has: 7 tables and 4 figures.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova, Akademiya nauk SSSR (Institute of General and Inorganic Chemistry, Academy of Sciences SSSR)

SUBMITTED: 12Feb64 ENCL: 00 SUB CODE: MM

NO REF SOV: 017 OTHER: 001

Card 2/2

LAZAREV, V.B.; MALOV, Yu.I.

Experimental study of the extrinsic photoeffect from the surface of diluted potassium amalgams in the liquid and solid states. Dokl. AN SSSR 161 no.4:875-877 Ap '65. (MIRA 18:5)

1. Institut obshchey i neorganicheskoy khimii im. N.S.Kurnakova AN SSSR. Submitted October 5, 1964.

L 4398-66 EWT(m)/EWP(t)/EWP(b) IJP(c) JD/JG

ACCESSION NR: AP5025867 UR/0020/65/164/004/0846/0848

AUTHOR: Lazarev, V. B.; Malov, Yu. I.

TITLE: Photoelectric phenomena in dilute alkali metal amalgams

SOURCE: AN SSSR. Doklady, v. 164, no. 4, 1965, 846-848

TOPIC TAGS: photoelectric effect, sodium amalgam, potassium, cesium, work function, adsorption

ABSTRACT: Photoemission currents from the surface of mercury-sodium solutions containing from 0 to 0.7 at% sodium and mercury-cesium solutions containing from 0 to 0.001 at% cesium were measured between +25 and -80°. A plot of the photoemission currents versus the alkali metal concentration for the same wavelength of incident light (3136 Å) showed the external photoelectric effect from the surface of cesium amalgams to be much greater than that from potassium amalgams and still greater than that from sodium amalgams. After determining the electron work functions ϕ, the authors compared them with reported data on the surface tension σ of these amalgams; the curves representing the concentration dependence of σ and ϕ were found to be similar. A study of the temperature dependence of photocurrents

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L 4398-66
ACCESSION NR: AP5025867

for the sodium, potassium, and cesium amalgams showed a marked increase in photoemission current, and a shift of the "red boundary" of the photoelectric effect toward longer wavelengths. This behavior or the temperature dependence may be explained by an increasing absorption of the alkali metal with decreasing temperature. Orig. art. has: 4 figures. [14]

ASSOCIATION: Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova Akademii nauk SSSR (Institute of General and Inorganic Chemistry, Academy of Sciences, SSSR)

SUBMITTED: 26Feb65 ENCL: 00 SUB CODE: GC, OP

NO REF SOV: 008 OTHER: 000 ATD PRESS: 4196

Card 2/2

L 11001-66 EWI(m)/EWP(t)/EWP(b) IJP(c) JD

ACC NR: AP5028720 SOURCE CODE: UR/0363/65/001/011/1901/1910

AUTHOR: Lazarev, V. B.; Dashevskiy, M. Ya.

ORG: Institute of General and Inorganic Chemistry im. N. S. Kurnakov, Academy of Sciences SSSR (Institut obshchey i neorganicheskoy khimii Akademii nauk SSSR); Institute of Metallurgy im. A. A. Baykov (Institut metallurgii)

TITLE: Surface phenomena and crystallization processes in doped indium antimonide alloys

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 11, 1965, 1901-1910

TOPIC TAGS: indium compound, antimonide, selenium, tellurium, germanium, surface tension, chemical absorption, metal crystallization, alloy, crystal growth

ABSTRACT: The effect of selenium, tellurium, and germanium on the surface tension of indium antimonide melts was studied, and it was shown that Se and Te are absorbed at the interface, whereas practically no absorption of germanium occurs. Differences in the growth of indium antimonide dendrites from melts doped respectively with Se and Te are due to the different absorbability of these substances on indium antimonide. A new method is proposed for estimating the effective generalized moments of elements and compounds, and it is shown that the structure of melts can be evaluated

Card 1/2 UDC: 546.682'861:532.6

L 11001-66

ACC NR: AP5028720

6

by using data on their surface tension and the concept of the generalized moment. It is suggested that the difference in the surface tension of two substances be used to characterize the difference in their molecular force fields. The relationships between the solubility of impurities, coefficients of their distribution, and diffusion constants and the difference in the surface tension of the solvent and additive are presented. In conclusion, the authors thank M. S. Mirgalovskiy for his continued interest and participation in the discussion of the results, and N. Ye. Il'in and A. V. Pershikov for assistance in the experiments. Orig. art. has: 10 figures, 2 tables, 4 formulas.

55 55 55

SUB CODE:20,11,07/ SUBM DATE: 05Jul65/ ORIG REF: 016/ OTH REF: 008

Card 2/2

LAZAREV, V.B. (Moskva)

Surface phenomena in molten germanium alloys. Zhur. fiz. khim. 39 no. 1:72-78 Ja '65 (MIRA 19:1)

1. Institut obshchey i neorganicheskoy khimii imeni N.S. Kurnakova AN SSSR. Submitted February 12, 1964.

LAZAREV, V.B.; PERSHIKOV, A.V.

Improved Rebinder instrument for measuring surface tension.
Zhur. fiz. khim. 39 no.6:1528-1529 Je '65. (MIRA 18:11)

1. Institut obshchey i neorganicheskoy khimii imeni Kurnakova.
Submitted Feb. 12, 1964.

ACC NR: AR6035419 SOURCE CODE: UR/0137/66/000/009/G052/G052

AUTHOR: Dashevskiy, M. Ya.; Mirgalovskaya, M. S.; Lazarev, V. B.

TITLE: Growing of indium antimonide crystals from melts doped with surface-active and surface-inactive additives

SOURCE: Ref. zh. Metallurgiya, Abs. 9G364

REF SOURCE: Sb. Poverkhnostn. yavleniya v rasplavakh i voznikayushchikh iz nikh tverd. fazakh. Nal'chik, 1965, 579-584

TOPIC TAGS: indium compound, antimonide, surface active agent, single crystal growing, surface tension, dendrite

ABSTRACT: A description is presented of a combined setup for growing of single crystals drawn from the melt and measuring the surface tension of the melt. Measurement of the surface tension of a melt of InSb doped with Ge or Se has shown that the Se is surface-active (it is adsorbed) while the Ge is surface-inactive (is not adsorbed) as an additive. Single crystals and dendrites of InSb were drawn from melts doped with germanium in the range 0.05 - 2.5 at.% and Se 0.024 - 0.25 at.%. With increasing Ge concentration in the melt, the width of the dendrite ribbons decreased. No noticeable influence of Ge on the growth of the single crystal was noted. Dendrites with large Si content could not be grown, for their growth stopped at 0.25 at.% Se. No morphological differences were noted between single crystals grown from melts alloyed with Se or Ge. The dependence of the supercooling of the InSb melt on the Ge or Se con-

Card 1/2 UDC: 621.315.592

ACC NR: AR6035419

centration shows that at these concentrations the Ge and Se have little influence on the value of the supercooling. (From RZh Fiz.) [Translation of abstract]

SUB CODE: 20

Card 2/2

ACC NR: AR7000837 SOURCE CODE: UR/0058/66/000/009/A049/A049

AUTHOR: Dashevskiy, M. Ya.; Mirgalovskaya, M. S.; Lazarev, V. B.

TITLE: Growing single indium antimonide crystals from melts doped with surface-active and surface-inactive impurities

SOURCE: Ref. zh. Fizika, Abs. 9A415

REF SOURCE: Sb. Poverkhnostn. yavleniya v rasplavakh i voznikayushchikh iz nikh tverd. fazakh. Nal'chik, 1965, 579-584

TOPIC TAGS: crystal, crystal growth, crystal impurity, indium antimonide, crystallography, surface active alloy, surface inactive alloy, surface active impurity, surface inactive impurity, impurity, semiconductor crystal, germanium alloy, selenium alloy, doping

ABSTRACT: A description is given of a device for growing monocrystals (C) by pulling them from a melt (M), and for measuring surface tension of M. Measurements of surface tension of M in InSb doped with Ge and Se showed that Se is a surface-active impurity, and that Ge is a surface-inactive impurity. Monocrystals

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ACC NR: AR7000837

and dendrites from M [sec] were grown, alloyed with Ge in the amount of 0.05—2.5 at % and with Se in the amount of 0.0024—0.25 at %. An increase in the concentration of Ge in the M was accompanied by a decrease in the width of dendrite strips. No particular effect of Ge on the growth of C was noted. No success was achieved in growing dendrites containing large amounts of Se, since at 0.25 at % of Se their growth ceases. No morphological differences were noted between C grown from M and alloyed with Se and K grown from P and alloyed with Ge. It was shown that within the given range of concentrations, Ge and Se affect the process of supercooling only slightly. G. Volkov. [Translation of abstract]

[SP]

SUB CODE: 20/

Card 2/2

ACC NR: AR7000855 SOURCE CODE: UR/0058/66/000/009/E008/E008

AUTHOR: Lazarev, V. B.; Dashevskiy, M. Ya.

TITLE: Study of surface phenomena in melts of semiconductors

SOURCE: Ref. zh. Fizika, Abs. 9E68

REF SOURCE: Sb. Poverkhnostn. yavleniya v rasplavakh i voznikayushchikh iz nikh tverd. fazakh. Nal'chik, 1965, 383-388

TOPIC TAGS: germanium semiconductor, semiconductor melt, selenium, thallium, antimony, atom, gallium, surface tension, surface phenomenon, impurity

ABSTRACT: A study is made of the influence of Sb, Bi, In, Ga and Tl impurities on the surface tension (σ) of Ge; and of Se, Tl and Ge on σ of indium antimonide. It was found that except for Ga, all additions mentioned lowered σ of Ge. In the case of InSb, Ge was surface-neutral. It was also found that the values of the limit surface activity of the investigated impurities were highest when their σ was the lowest, by comparison with Ge and InSb. It is shown that

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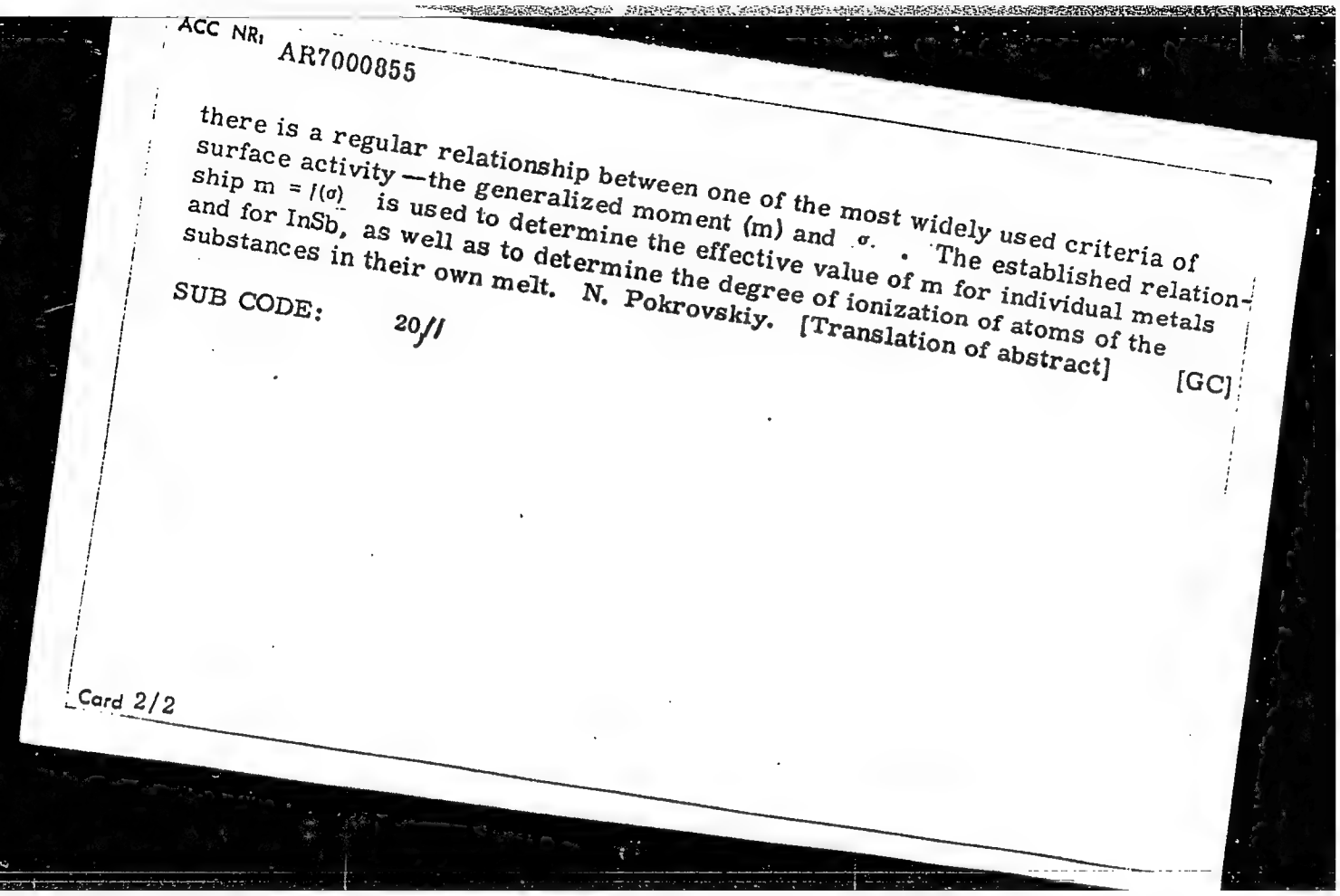

ACC NR: AR7000855

there is a regular relationship between one of the most widely used criteria of surface activity—the generalized moment (m) and σ. The established relationship $m = f(\sigma)$ is used to determine the effective value of m for individual metals and for InSb, as well as to determine the degree of ionization of atoms of the substances in their own melt. N. Pokrovskiy. [Translation of abstract] [GC]

SUB CODE: 20/11

Card 2/2

ACC NR: AP7005591

SOURCE CODE: UR/0020/67/172/002/0403/0406

AUTHOR: Dashevskiy, M. Ya; Kukuladze, G. V.; Lazarev, V. B.; Mirgalovskaya, M. S.

ORG: Metallurgy Institute im. A. A. Baykov, Academy of Sciences, SSSR (Institut metallurgii Akademii nauk SSSR); Institute of General and Inorganic Chemistry im. N. S. Kurnakov, Academy of Sciences, SSSR (Institut obshchey i neorganicheskoy khimii Akademii nauk SSSR)

TITLE: Surface phenomena and crystallization processes in gallium antimonide melts

SOURCE: AN SSSR. Doklady, v. 172, no. 2, 1967, 403-406

TOPIC TAGS: surface tension, gallium compound, antimonide, crystallization

ABSTRACT: In order to determine the general applicability of the regularities characterizing the relationship between surface phenomena and crystallization processes in indium antimonide melts, the following phenomena were investigated: surface tension of melts of the gallium-antimony system, influence of zinc and tellurium on the surface tension of gallium antimonide, and influence of these admixtures on the supercooling of Ga-Sb melts and on the growth of crystals from the melts. It is suggested that the behavior of the impurities in the solvent melt can be predicted from the difference of surface tensions in the case of type $A^{III}Sb$ antimonides. In $A^{III}B^{V}$ compounds which crystallize in a zinc-blende-type lattice, a correlation exists between the mean atomic number of the compound and the surface tension at the

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UDC: 546.682'861:532.6

ACC NR: AP7005591

melting point: the higher the mean atomic number, the lower the surface tension of the compound. Data on the effect of Te on the supercooling of indium antimonide indicate that surface-active admixtures increase the probability of formation of a solid phase nucleus. At a certain concentration of Te, the growth of lamellar dendrites of gallium antimonide was hindered, causing distorted dendrites to grow, then was stopped altogether as the Te content increased further. The introduction of zinc in appreciable amounts did not interfere with the growth of lamellar dendrites of gallium antimonide. The regularities found by studying the role of surface phenomena in the crystallization of indium antimonide melts were found to apply to gallium antimonide as well, and are therefore thought to cover at least all compounds of type $A^{III}B^{V}$ which crystallize in a zinc-blende-type lattice. The paper was presented by Academician Sazhin, N. P., 4 Apr 66. Orig. art. has: 3 figures and 1 table.

SUB CODE: 11,20/ SUBM DATE: 04Apr66/ ORIG REF: 009/ OTH REF: 001

2/2

LAZAREV, V.D., inzh; TSAL', M.A., inzh.

Overall mechanization and automation of hardware production. Mekh. i avtom. proizv. 17 no.4:3-5 Ap '63. (MIRA 17:9)

S/196/61/000/011/002/042
E194/E155

AUTHORS: Levin, A.I., and Lazarev, V.F.

TITLE: The use of alternating current in forming lead accumulator plates

PERIODICAL: Referativnyy zhurnal, Elektrotekhnika i energetika, no.11, 1961, 20, abstract 11A 117. (Vestn. elektroprom-sti, no.6, 1961, 60-62)

TEXT: The effects that result from superposing a.c. on d.c. in the process of forming lead accumulator plates were investigated. The a.c. current density was 0.715 A/dm^2, while the d.c. current density ranged from 0.715 to 4.29 A/dm^2. The ratio of direct to alternating current density was maintained constant and greater than 1 during each test. The paste for the positive electrode was made of litharge and red lead and that for the negative of lead powder. It was found possible to increase the direct-current density by a factor of 2 - 3 as compared with the value normally used in production and to cut the forming time from 15-18 to 5-6 hours without appreciably increasing the temperature. If the d.c. is more than 3 times the a.c. component

Card 1/2

The use of alternating current ... S/196/61/000/011/002/042
E194/E155

there is, however, a notable diminution in the effectiveness of the plate-forming conditions with change in the direction of current. With the above mentioned ratio of current densities the a.c. has no appreciable influence on the electro-chemistry chemical composition or porosity of the active substance of starter accumulator plates but appreciably increases their mechanical strength.
5 literature references.

[Abstractor's note: Complete translation.]

Card 2/2

LEVIN, A.I.; LAZAREV, V.F.

ChM foam-producing agent and its effect on the formation of lead plates of a storage battery. Zhur.prikl.khim. 35 no.1:123-127 Ja '62. (MIRA 15:1)

1. Ural'skiy politekhnicheskiy institut imeni S.M.Kirova.
(Surface-active agents) (Electrochemistry)
(Storage batteries)

LAZAREV, V.F.; LEVIN, A.I.

Nature of the polarization in the formation of lead from lead sulfate. Zhur. fiz. khim. 36 no.6:1318-1320 Je'62
(MIRA 17:7)

1. Ural'skiy politekhnicheskiy institut imeni Kirova.

LEVIN, A.I.; LAVANOV, V.P.; MUKHIN, V.A.

Electrolytic lead coating of auxiliary parts of a storage battery using sulfamine electrolytes. Zhur. prikl. khim. 38 no.7:1569-1574 Jl '65. (MIRA 18:7)

1. Ural'skiy politekhnicheskiy institut.

LAZAREV, V.F.; OVCHARENKO, V.I.; LEVIN, S.I.; RUDOY, V.M.

Effect of surface active substances on the process of passivation of a lead electrode. Zhur. prikl. khim. 38 no.6:1304-1309 Je '65. (MIRA 18:10)

1. Voronezhskiy politekhnicheskiy institut imeni S.M.Kirova.

LAZAREV, V. G.

Lazarev, V. G., Levitina, G. A., and Magnitskiy, A. N. "Changes in subordination in traumas of the peripheral nervous system", in the collection: Subordinatsiya v nervnoy sisteme i yeye znacheniye v fiziologii i patologii, Moscow, 1948, p. 100-09.

SO: U - 3042, 11 March 53, (Letopis "Zhurnal "nykh Statey, No. 7, 1949)

LAZAREV, V. G.,

Verzilova, C. V., Lazarev, V. G., and Magnitskiy, A. N. "Changes in subordination in brain trauma", in the collection: Subordinatsiya v nervnoy sisteme i yeye znacheniye v fiziologii i patologii, Moscow, 1948, p. 110-22, - Bibliog: 7 items.

SC: U - 3042, 11 March 53, (Letopis "Zhurnal "nykh Statey, No. 7, 1949)

LAZAREV, V.G.

USSR/ Molecular theory

Card 1/1 Pub. 22 - 9/46

Authors : Lazarev, V. G. Act. Mem. Acad. Scs., and Ovcharenko, O. N.

Title : About the effect of crystallic lattice holes on the electric resistance of a metal

Periodical : Dok. AN SSSR 100/5, 875-878, Feb 11, 1955

Abstract : The results of experiments with the electric conductivity are described and analyzed. The experiments were conducted for the purpose of establishing the correctness of the theory dealing with the effect of the so-called crystal lattice holes on the electric conductivity of metals.*) Eleven references: 2 French, 6 USA, 2 USSR and 1 German (1931-1953). Graphs.

Institution : Academy of Sciences of the USSR, Physico-Technical Institute

Submitted : .....

*) In the abstracted article, the R is used as the universal constant and as a metal resistance.

112-1-2396 D

Translation from: Referativnyy Zhurnal, Elektrotekhnika, 1957, Nr 1, p. 349 (USSR)

AUTHOR: Lazarev, V.G.

TITLE: Methods of Objective Evaluation of the Principles of Constructing an All-Relay System for the Automatic Office (on the Example of a Relay Telephone Substation) [Metodika ob''yektivnoy otsenki printsipov postroyeniya releynykh ustroystv ATC (na primere releynoy telefonnoy podstantsii)]

ABSTRACT: Bibliographic entry on the author's dissertation for the degree of Candidate of Technical Sciences, presented to the Moscow Electrical Communications Engineering Institute (Mosk.elektrotekhn. in-t svyazi), Moscow, 1956.

ASSOCIATION: Moscow Electrical Communications Engineering Institute (Mosk.elektrotekhn. in-t svyazi, Moscow)

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LAZAREV, V.G.

Determining the minimum number of intermediate relays in designing multicontact circuits. Sbor.nauch.rab.po prov.sviazi. no.5:93-103 '56. (Electric relays) (MLRA 9:9)

LAZAREV, V. G.

"The Method of Determiningthe Minimum Relay Number."

report presented at All-Union Conference on Problems in the Theory of Relay Devices, Inst. for Automation and Remote Control AN USSR, 3-9 Oct 1957.
Vestnik AN SSSR, 1958, No. 1, v. 28, pp. 131-132. (author Ostianu, V. M.)

ARKHANGEL'SKAYA, A. A., LAZAREV, V. G. and ROGINSKIY, V. N.

"A Machine for the Synthesis of Contact Poles."

rpport presented at All-Union Conference on Problems in the Theory of Relay Devices, Inst. for Automation and Remote Control AN USSR, 3-9 Oct 1957.
Vestnik AN SSSR, 1958, No. 1, v. 28, pp. 131-132. (author Ostianu, V. M.)

LAZAREV, V. G.

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Author: [illegible]

Title: All-Union Conference on the Theory of Relay Systems. (Vsesoyuznoye soveshchaniye po teorii ustroystv releynogo deystviya).

Publication: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1958, No.2, pp. 167-168 (USSR).

ABSTRACT: The Institute of Automation and Telemechanics of the Ac. Sc. USSR (Institut Avtomatiki i Telemekhaniki Akademii Nauk SSSR) convened in October, 1957 an All Union Conference on the theory of relay systems. The Aim of the conference was to evaluate the present state of the problem of the theory of relay operation, particularly evaluation of the problems of synthesis, analysis and transformation of the structure of relay equipment, optimum construction and assembly of such structures, automation of the processes of synthesis and analysis of such structures. Over 330 representatives of research establishments, works' laboratories and project organizations from numerous centres of the USSR as well as scientists from Roumania, Hungary and Czechoslovakia participated in the conference.

In his opening address M. A. Gavrilov reported on the

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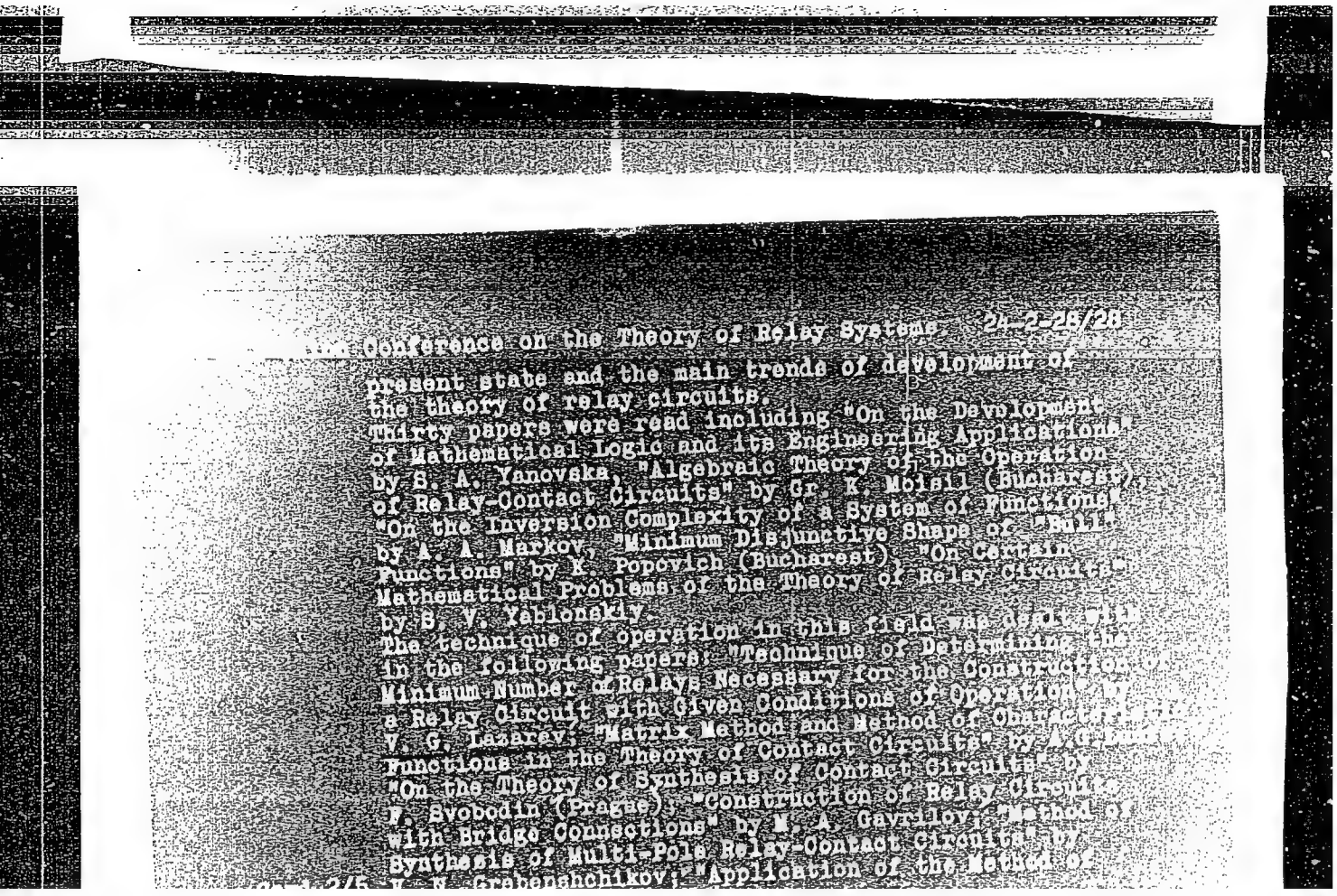
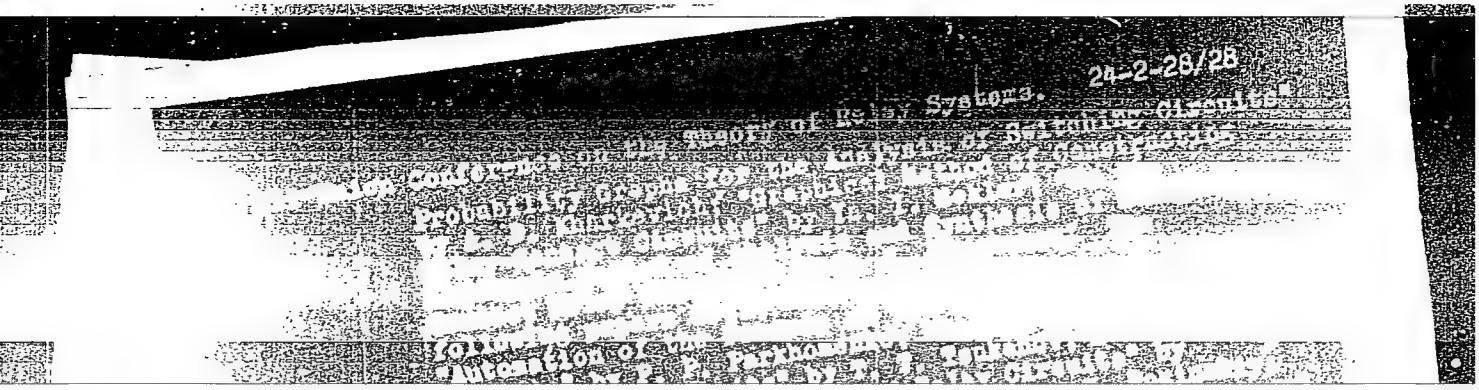


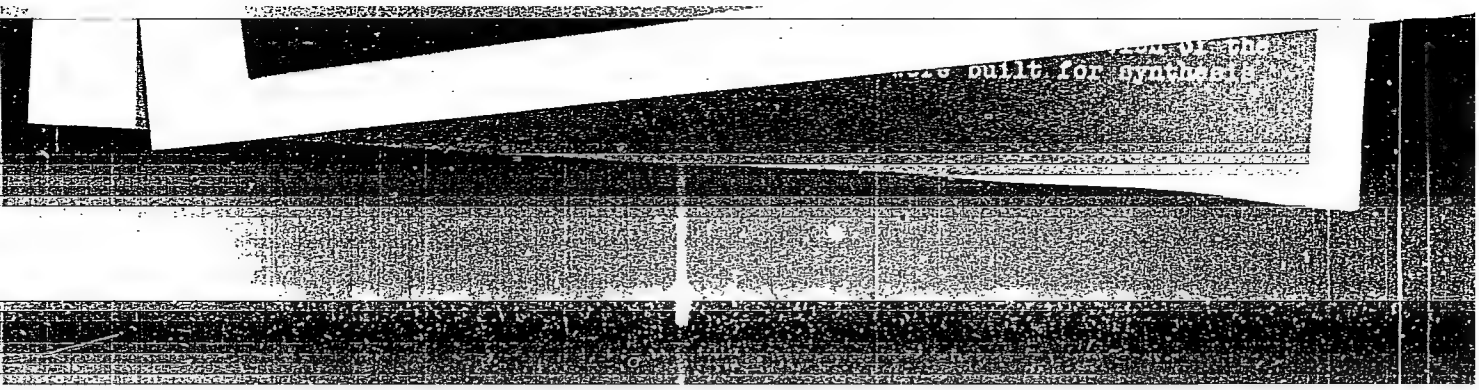
Conference on the Theory of Relay Systems 2d-2-28/28

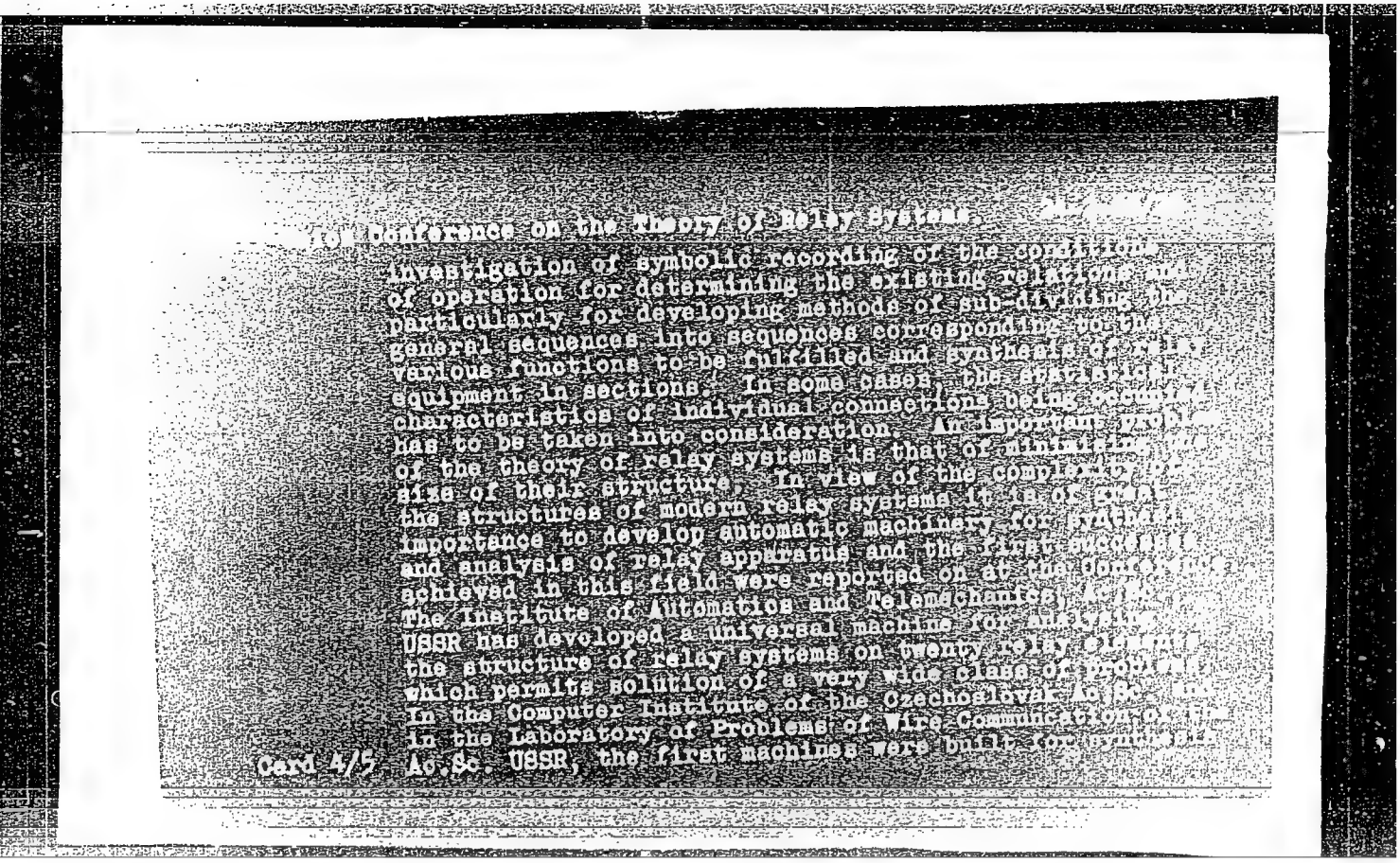
present state and the main trends of development of the theory of relay circuits.

Thirty papers were read including "On the Development of Mathematical Logic and its Engineering Applications" by S. A. Yanovska, "Algebraic Theory of the Operation of Relay-Contact Circuits" by Gr. K. Moisil (Bucharest), "On the Inversion Complexity of a System of Functions" by A. A. Markov, "Minimum Disjunctive Shape of Boolean Functions" by K. Popovich (Bucharest), "On Certain Mathematical Problems of the Theory of Relay Circuits" by S. V. Yablonskiy.

The technique of operation in this field was described in the following papers: "Technique of Determining the Minimum Number of Relays Necessary for the Construction of a Relay Circuit with Given Conditions of Operation" by V. G. Lazarev; "Matrix Method and Method of Chain Functions in the Theory of Contact Circuits" by A. D. [illegible]; "On the Theory of Synthesis of Contact Circuits" by V. Svobodin (Prague); "Construction of Relay Circuits with Bridge Connections" by M. A. Gavrilov; "Method of Synthesis of Multi-Pole Relay-Contact Circuits" by V. [illegible] Grabenshchikov; "Application of the Method of







Conference on the Theory of Relay Systems

Investigation of symbolic recording of the conditions of operation for determining the existing relations, in particularly for developing methods of sub-dividing the general sequences into sequences corresponding to the various functions to be fulfilled and synthesis of equipment in sections. In some cases, the characteristics of individual connections being ... has to be taken into consideration. An important ... of the theory of relay systems is that of ... aim of their structure. In view of the complexity ... the structures of modern relay systems it is of great importance to develop automatic machinery for ... and analysis of relay apparatus and the ... achieved in this field were reported on at the ... The Institute of Automatics and Telemechanics ... USSR has developed a universal machine for ... the structure of relay systems on twenty ... which permits solution of a very wide class of ... In the Computer Institute of the Czechoslovak ... in the Laboratory of Problems of Wire Communication ... Ac.Sc. USSR, the first machines were built ...

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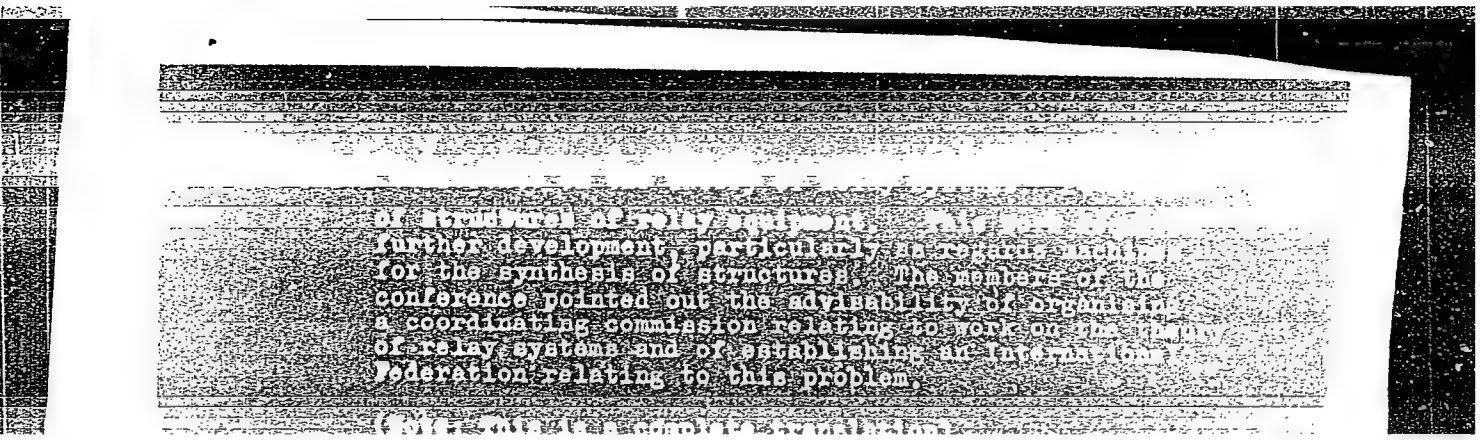
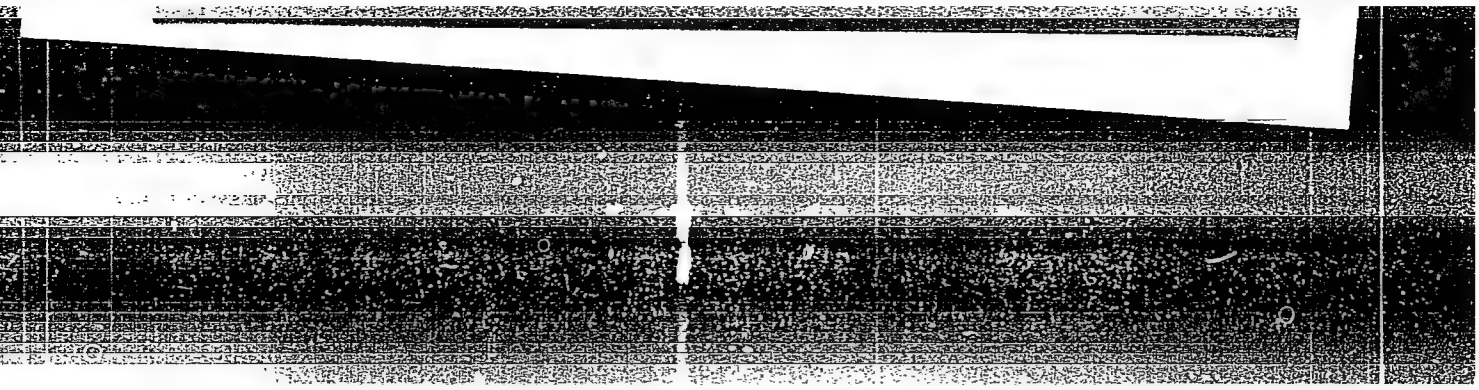


further development, particularly in regard to
for the synthesis of structures. The members of the
conference pointed out the advisability of organizing
a coordinating commission relating to work on
of relay systems and of establishing an international
federation relating to this problem.



APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R000928920006-5"

AUTHORS: Lazarev, V. G., Sagalovich, Yu. L. (Moscow) 103-19-5-9/14

TITLE: On a Certain Type of Commutation Circuits
(Ob odnom tipe kommutatsionnykh skhem)

PERIODICAL: Avtomatika i Telemekhanika, 1958, Vol. 19, Nr 5, pp. 464-467 (USSR)

ABSTRACT: Beside the general methods for the synthesis of relay-contact-circuits (References 1-4) special methods for individual types of circuits exist by means of which the projection of the circuit can be considerably simplified and accelerated. Such a method for the construction of a commutator is suggested here. This method uses some data from group theory. The problem of the construction of a commutator arose in connection with the elaboration of the machine for the synthesis of the contact circuit (Reference 6) which models the cascade-method (Reference 3) (graphical method - Reference 4). The type of commutation circuits investigated here is a circuit of the recomputation of dual numbers in various permutations of their place. The method of synthesis based upon the employment of the

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group-permutation-theory yields the possibility of obtaining optimum circuits with a small expenditure of energy in their composition. The formula for the computation of the number of contacts necessary for the construction of the investigated commutation circuits is given.
There are 2 figures and 7 references, all of which are Soviet.

SUBMITTED: July 8, 1957

AVAILABLE: Library of Congress

1. Mathematical computers--Circuits

KHARKEVICH, A.D.; ROGINSKIY, V.N.; OPOL'SKAYA, Ye.K.; LAZAREV, V.G.; SHAPIRO, S.B.; GORYACHEV, V.A.; FARAFONOV, L.S., otv.red.; BALAKIREV, A.F., red.; KARABILOVA, S.F., tekhn.red.

[Crossbar telephone substation; information collection] Koordinatnaia telefonnaia podstantsiia; informatsionnyi sbornik. Moskva, Gos.izd-vo lit-ry po voprosam sviazi i radio, 1959. 87 p. (MIRA 13:1)
(Telephone, Automatic)

LAZAREV, V G

6(0) PHASE I BOOK EXPLOITATION SOV/2793

Akademiya nauk SSSR. Laboratoriya sistem peredachi informatsii

Problemy peredachi informatsii. vyp. 3: Koordinatnyye sistemy ATS (Problems of Information Transfer. Nr. 3: Crossbar Systems) Moscow, Izd-vo AN SSSR, 1959. 147 p. 2,000 copies printed.

Ed. of Publishing House: K. I. Grigorash; Tech. Ed.: T. V. Polyakova; Editorial Board: A. A. Kharkevich (Resp. Ed.), V. N. Kuznetsov, I. A. Ovseyevich, V. N. Roginskiy (Resp. Ed. of this Number), and V. G. Solomonov (Deputy Resp. Ed.).

PURPOSE: This collection of articles may be useful to engineers engaged in the design of crossbar automatic telephone systems.

COVERAGE: The authors discuss the principle of operation of crossbar automatic telephone systems and their components. They discuss methods of switching and using crossbar connectors in selector units and present block diagrams of

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individual units and of the entire automatic telephone system. They also explain the principle of constructing master-switch circuits and present methods of calculating losses in systems. Articles 1 and 3 were presented at the conference of the Wire Communication Section of NTOF i E imeni A. S. Popov on July 15, 1956. Articles 2, 4 and 5 were presented at the Joint Session of the Laboratory and Chair of Telephony of MEIS on September 21, 1956, December 11, 1957, and November 23, 1956, respectively. No personalities are mentioned. References appear at the end of each article.

TABLE OF CONTENTS:

matic telephone systems. A discussion of a master-switch circuit for a subscriber selector unit is presented only for the case of transposed connections of subscriber lines. There are 18 references: 11 Soviet and 7 English.

Kharkevich, A. D. - Calculation of the Number of Connecting Devices in a Crossbar Automatic Telephone System. 115

The author discusses methods of calculating losses in a multistage system by analyzing a two-stage circuit. He also derives formulas for calculating losses and presents numerical examples. There are 12 references: 7 Soviet and 5 English.

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LAZAREV, V. G.

6(7) 83 PHASE I BOOK EXPLOITATION SOV/3016

Akademiya nauk SSSR. Laboratoriya sistem peredachi informatsii

Problemy peredachi informatsii. Vyp. 1: Postroyeniye skhem i setey svyazi. (Problems of Information Transmission. Nr. 1: Design of Communications Circuits and Networks) Moscow, Izd-vo AN SSSR, 1959. 163 p. Errata slip inserted. 2,000 copies printed.

Ed. of Publishing House: G. Ye. Pevzner; Tech. Ed.: A. P. Guseva; Editorial Board: A. A. Kharkevich (Resp. Ed.), V. N. Kuznetsov, I. A. Ovseyevich, V. N. Roginskiy (Resp. Ed. of this Issue), V. G. Solomonov (Deputy Resp. Ed.)

PURPOSE: This collection of articles is intended for specialists in communications theory.

COVERAGE: This collection of articles by scientists at the Laboratory of Systems for the Transmission of Information, Academy of Sciences, USSR, is a continuation of a series of collections published earlier under the title "Sbornik nauchnykh rabot po provodnoy svyazi" ("Collection of Scientific Works on Wire

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Communications") References are given after each article. A bibliography on automatic telephone systems (ATS) with crossbar switches is given in the appendix. This bibliography is considered to be of special interest in connection with the introduction in the USSR of the crossbar system.

TABLE OF CONTENTS:

unutilized states. According to the author, this method in certain cases results in a more efficient use of circuits than is possible by analytic methods. It also makes possible mechanization of the synthesis of relay systems. There are 9 references, all Soviet.

Arkhangel'skaya, A. A., V. G. Lazarev, and V. N. Roginskiy. Apparatus for the Synthesis of Contact Circuits 41

This paper was presented at the Laboratory Seminar on October 5, 1956. The authors present basic principles of designing an apparatus for the synthesis of contact (1,k)-terminal networks. This apparatus was developed at the Laboratory on the basis of the graphical method. There are 9 references: 8 Soviet and 1 English.

Lazarev, V. G. Methods of Determining the Number of Relays Necessary for Designing a Relay-Contact Circuit According to Given Operating Conditions 53

This paper was presented at a session of the Scientific and Technical Society of Radio Engineering and Electrocommunications imeni A. S. Popov on May 10, 1956. In this paper, principles are outlined for selecting the minimum number of relays necessary for the synthesis of relay-contact circuits. The minimum number of receiver components and methods of selecting the minimum number of receiving relays are also presented. The author considers the problem of determining the common minimum of receiving and intermediate relays necessary for designing circuits according to given conditions. There are 8 references: 6 Soviet and 2 English.

Kharkevich, A. D. Selecting a Grouping Lay-out for a Telephone System Substation 72

This paper was presented at a joint session of the Laboratory Seminar and Department of Telephony at MEIS on June 24, 1953. The author investigates grouping schemes useful in designing small-capacity telephone

system substations with the routing of intercommunications through a regional crossbar system. An evaluation of variations of grouping schemes according to the overall number of connection points is made and the optimum substation grouping scheme is selected and equipped with switching relay-action devices. There are 13 references: 9 Soviet and 4 English

Melik-Gaykazova, E. I., L. I. Smirnova and A. D. Kharkevich. Experimental Investigation of the Carrying Capacity of the Grouping Lay-out of a Telephone System Substation 103

The paper was presented at the Laboratory Seminar on October 26, 1956. The selection of the grouping scheme was specified by the authors on the basis of data obtained from calculations using the method of artificial loading. The substation had a capacity of 100 numbers, with two connection stages for outgoing, and three connection stages for incoming traffic. On the basis of this investigation, the authors determine the most convenient distribution of outgoing trunks among the intermediate switches,

the necessary number of internal trunks between the incoming and intermediate switches, and the holding sequence of the internal trunks. There are 7 references, 3 Soviet and 4 English.

Analysis of Grouping Lay-out of a Telephone System Substation Using the Method of Probability Graphs 118

This paper was presented at the Laboratory Seminar on November 23, 1956. A method using probability graphs for calculating the carrying capacity of complex switching networks is presented. A telephone substation with two connection stages for outgoing and with three connection stages for incoming traffic is investigated using probability graphs. On the basis of this investigation the author determines the most convenient graph topology, using crossbar trunks in developing substation switching. In an appendix a new treatment of the probability graph is presented. There is 1 English reference.

Problems of Information (Cont.) SOV/3016

This bibliography with annotations contains a list of 69 articles, company data and books; 29 information notes and 89 Swedish patents.

Work of Laboratory Seminars on the Development of Scientific Problems of Wire Communication of the Academy of Sciences, USSR, 1956

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ARKHANGEL'SKAYA, A.A.; LAZAREV, V.G.; ROGINSKIY, V.N.

Machine for the synthesis of contact circuits. Probl. pered. inform. no.1:41-52 '59. (MIRA 13:3)
(Switching theory) (Electric relays)

LAZAREV, V.G.

Method of determining the number of required relays for the design of contact relay circuits with given operating conditions. Probl. pered. inform. no.1:53-71 '59. (MIRA 13:3)
(Electric relays) (Switching theory)

LAZAREV, V.G.; SAVVIN, G.G.; SMIRNOVA, L.I.

Fundamental principles in the design of controlling units for crossbar automatic telephone exchanges. Probl.pered.inform. no.3:78-114 '59. (MIRA 13:1)
(Telephone, Automatic)

IAZAREV, V.G.; SAGALOVICH, Yu.L.

Commutator of a machine for synthesis of switching circuits. Probl. pered. inform. no.4:124-132 '59. (MIRA 13:7)
(Telephone, Automatic) (Switching theory)

LAZAREV, V. [G.]

report to be presented at the 1st Intl Congress of the Intl Federation of Automatic Control, 25 Jun-5 Jul 1960, Moscow, USSR.

BYKHOVSKIY, M. L. - "Ultra stability in electronic calculating devices
in the solution of nonlinear equations in indefinite form"
CHELYUSTKIN, A. B. - "Use of calculating devices in systems for
the automatic control of rolling mills"
CHICHINADZE, V. K. - "Concerning some problems of the organization of
self-adjusting and self-teaching systems of automatic control,
based on principles of random search"
DAVYDOV, N. I. - "Development of automatic control systems for boiler
units"
DUDNIKOV, Ye. G. - "Determination of optimum adjustments of industrial
automatic regulation systems according to initial data obtained from
experience"
DUB'YE, A. I., and ROZENVASSER, E. N. - "Methods of organizing Lyapunov
functions in the theory of nonlinear regulating systems"
DRUZHININ, N. N. - "Balanced regulation and inter-communications of
a multi-motor electric drive and technology in continuous rolling
mills"
FEL'DBAUM, A. A. - "Problems of statistical theory of automatic
optimization systems"
FEYGIN, V. I. - "Automation of a reversible cold rolling mill for
nonferrous metals"
FILIPPOV, A. F. - "Application of the theory of differential equations
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GAVRILOV, M.A. - "Structural surplus and operational reliability of
relay devices"
GANKIN, M. Z. - "Automation of irrigation systems"
GERTSENBERG, G. R., KASHTELYAN, V. Ye., KOSTENKO, M. P., NEYMAN, L. R.,
and SIRKY, N. S. - "Power regulation of disturbance and problems of
the stability of electric power systems"
GINZBURG, S. A. - "Logical method of synthesis of functional converters"
IL'IN, V. A. - "Methods of transmission of information and the structure
of telemechanical systems for dispersed structures"
INOSOV, V. L., and LUTSKIY (fnu) - "The code-impulse system of tele-
measurement for dispatched operations of trunk-line gas pipe lines"
IVAKHNENKO, A.G. - "Concerning the application of the theory of combined
regulation systems for cybernetic adaptation systems"
KARANDEYEV, K. B., and SHTAMBERGER, G. A. - "A quasi-equilibrated bridge
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KAZAKOV, I. E. - "Some problems of the theory of statistical linearization
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KILIN, F. M. - "Some problems of the theory of impulse systems with
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KOBRINSKIY, A. E., BOLKHOVITIN, S. V., VOSKOBOYNIKOV, L.M., IOFFE, D. M.,
POLYAN, E. P., POPOV, B. P., SLAVUTSKIY, Ya. L., SYSIN, A. Ya., and
YAKOBSON, Ya. S. - "The problem of bioelectric control"
KOLOMIYETS, B.T. - "New types of photo resistances and their field of use"
KOROBKO, M.I., MIKRYUKOV, B. G., and SUKHILOV, K. A. - "System of
automatic control and regulation of blast distribution in the Tuyeres
of blast furnace"
KOROBOCHKIN, B. L. - "Investigation of the dynamics of the hydraulic
duct of a copying lathe"
KRASOVSKIY, A. A. - "Dynamics of continuous systems of automatic
regulation with extra self-adjustment of corrective devices"
KRASOVSKIY, N. N. - "Concerning the selection of parameters of
optimum stability systems"
KUKHTENKO, A. I. - "The dynamics of devices imitating living organisms"
KULEBAKIN, V. S. - "The invariant theory of automatic regulation and
control systems"
LANIN, I. D. - "Pneumatic calculating devices as a means of insuring the
reliability of complex automation systems"
LAZAREV, V. G., and PARKHOMENKO, P.P. - "Mechanization of processes
of analysis and synthesis of the structure of relay devices"